

ZINC PLATE WITH BLUE BRIGHT CHROMATE

DOCUMENT IDENTIFIER: A-SP-EL00092-04-B04X Rev B, 22-Jan-1991

REVISION HISTORY: Rev A, 20-May-1988.

1 PURPOSE

To provide corrosion protection for ferrous alloys. The use of the supplementary blue bright chromate treatment provides a surface with lower electrical contact resistance than the zinc with yellow chromate. This finish is considered nondecorative and is used on internal surfaces.

2 DESCRIPTION

Zinc plate with a supplementary blue bright chromate is used per the requirements of ASTM B633, unless otherwise specified. The supplementary treatment shall be accomplished by the single-dip blue bright chromate conversion process, nonelectrolytic. The use of dyes, lacquers, waxes, or any additional materials will interfere with the electrical contact required and shall be unacceptable. Bleaching or other color lightening processes after the chromate conversion coating are unacceptable.

This document is confidential and proprietary. It is an unpublished work protected under the Federal copyright laws.

© Digital Equipment Corporation. 1990,1991. All rights reserved.

Copies of this specification may be provided to qualified Digital suppliers.

APPROVAL: This specification is approved for use within Digital Equipment Corporation.

Art Clockedile, Systems Materials Engineering

3 PHYSICAL REQUIREMENTS

a. Base material surface preparation:

The general appearance and quality of the plating is dictated by the surface to which it is applied. No mechanical preparations will be done to eliminate flaws, scratches, operation marks, and other defects, unless otherwise specified.

b. Film Thickness: .0002 inch minimum

Acceptable film thickness test methods:

Magnetic	ASTM B499
Coulometric	ASTM B504
Microscopical	ASTM B487

In the event of conflicting results, the microscopical method shall take precedence.

c. Surface resistivity:

The surface resistivity, per DEC STD 092-3, shall be 0.1 ohm per square inch or less, unless otherwise specified.

4 QUALITY OF PLATING

a. Thickness:

Unless indicated on the drawing, the thickness shall be controlled as specified on significant surfaces. Significant surfaces are areas that can be touched by a 0.75 inch (20 mm) diameter ball.

In holes, recesses, and other areas where controlled deposit cannot be obtained under normal plating conditions, the plate thickness shall be what results from control of the plating on the significant surfaces. Coverage and continuity must be ensured by visual inspection.

b. Adhesion requirements:

Any or all of the following tests may be used to test adhesion to the base material.

1. Tape Test Method:

Scotch Brand #600, 1-inch-wide tape shall be applied on the surface with uniform pressure. Within 90 ± 30 seconds of application, the tape shall be removed in a quick motion at 90 degrees to the surface. For acceptance, the finish shall remain unbroken after the tape is removed.

4 QUALITY OF PLATING (Continued)**2. Bend Test: (ASTM B571)**

Evidence of poor adhesion, peeling, or flaking of the coating from the substrate are causes for rejection. Cracking is acceptable in the bend area, unless the plating peels away from the substrate.

3. Scribe Test:

Scrape the surface of the plated article to expose the base material. Examine the sample at four times magnification to determine if removal has been caused by cutting away of an adherent plate or by lifting of a nonadherent plate. A nonadherent lifting is considered rejectable.

4. Burnishing Test: (ASTM B571)

After the sample is rubbed for 15 seconds, the test area shall not have any blisters. Lifting or peeling of the plating is not acceptable.

c. Environmental Exposure:

The test specimen shall be 4 inch x 6 inch x 16 GA cold-rolled steel. One hole, for the purpose of racking, is acceptable. However, no other mechanical preparation of the test specimen shall be performed. The test specimen shall be plated with .0002- to .0003- inch zinc and the supplementary blue bright chromate. The samples shall be aged a minimum of 24 hours and a maximum of 72 hours before testing.

Salt Spray:

ASTM B117 shall be used to determine salt spray resistance using a five percent salt concentration. Panels shall be suspended vertically in the chamber for a duration of 48 hours.

After the environmental test there shall be no evidence of gross film failure such as flaking or loss of adhesion. Corrosion of the base steel (red corrosion) and more than 5% corrosion products of the zinc (white corrosion) are unacceptable. Disregard 1/4 inch around the edges.

5 APPEARANCE QUALITY

Unless otherwise specified, this finish shall meet a quality level of 5, per *DEC STD 092-1 Finish and Color Standard - Finish Standard for Applicators*.

The finish shall have uniform appearance and color; be smooth, fine grained, semi-bright, adherent, and free from coating residues, blisters, pits, nodules, indications of burning, and any other defects that may affect the functional properties of this coating.

The surface appearance shall be a semi-bright to bright and have a bluish cast with slight iridescence. For example, a dull yellow appearance over the entire surface of the plate is not acceptable. It may be necessary to view the surface at an angle to discern the bluish color.

5 APPEARANCE QUALITY (Continued)

Superficial stains, which are the result of liquid runoff from chromate or the rinsing process, are acceptable. Those stains are light yellow in color and evident at edges, cutouts, holes, and so on. However, excessive drip marks, which are yellow to dark yellow or brown, are cause for rejection.

Chromate discoloration up to 1/8 inch adjacent to spot-welded seams is acceptable. However, white precipitate and loose particles from welded seams are not acceptable.

This finish is susceptible to fingerprinting, which may affect the functional requirements; therefore, they are cause for rejection.

6 PACKAGING/STORAGE/HANDLING

Before, during, and after plating, the parts shall not be subjected to any hostile environments that may affect the appearance or function of the coating. The plated parts shall also be packaged to protect the parts and their finish during normal handling operations, transportation, and storage.

The chromate film is relatively fragile and susceptible to fingerprint marking (especially during the first 24 hours). Steps should be taken to protect the surfaces during further handling and assembly operations.

7 GENERAL REQUIREMENTS

When agreed upon with the responsible Digital Engineer, if it is not practical to subject the parts to the tests specified, the test may be made by the use of separate specimens plated concurrently with the articles represented. The separate specimens shall be of a basic metal equivalent to that of the articles represented.

This finish may be specified by the responsible Digital Engineer on nonferrous metal alloys per the appropriate ASTM Specification. For example: *ASTM B252 Preparation Of zinc Alloy Die Castings*, *ASTM B253 Preparation Of and Electroplating on Aluminum Alloys*. Both of these base materials require a .0003-inch copper plate and a minimum of .0004-inch zinc plate.

Use of this finish is a function of the implementation. Surfaces to which it is applied, the complexity of the part, and the use of this finish must be proven by actual product testing and evaluation.

Regardless of appearance at any viewing distance, no defect is allowed that will affect the functional properties of the finish or the part. Suspect conditions shall be resolved by the responsible engineering group.

Inspection procedure 76-65333-00 may be used for inspection purposes, initial qualification, and periodic auditing of the plating process.